providing a base wafer;

forming a sensor cavity in said base wafer;

coupling a diaphragm wafer to said base wafer, said diaphragm wafer including a diaphragm portion, a sacrificial portion, and an insulating layer disposed between said diaphragm portion and said sacrificial portion, and wherein said diaphragm wafer is coupled to said base wafer such said diaphragm portion generally covers said sensor cavity;.

reducing the thickness of said diaphragm wafer by removing at least part of said sacrificial portion while using said insulating layer as an etch stop; and

forming or locating at least one piezo resistive portion on said diaphragm portion.

A1 cont

2. (Amended) The method of claim 1 wherein said diaphragm wafer is a silicon-on-insulator wafer including upper and lower silicon layers separated by said insulating layer, and wherein said upper silicon layer includes said sacrificial portion and said lower silicon layer includes said diaphragm portion, and wherein said reducing step includes removing substantially all of said upper silicon layer of said diaphragm wafer located over said sensor cavity.

A2

c29 27. (Amended) A method for forming a sensor comprising the steps of:

providing a silicon base wafer;

forming a sensor cavity in said base wafer;

coupling a silicon diaphragm wafer to said base wafer by fusion silicon bonding, said diaphragm wafer including a diaphragm portion, at least one of said base wafer or said diaphragm wafer being a silicon-on-insulator wafer having an upper silicon layer, a lower silicon layer, and an insulating layer disposed therebetween, and wherein said diaphragm wafer is coupled to said base wafer such that said diaphragm portion generally covers said sensor cavity; and

forming or locating at least one piezo resistive portion on said diaphragm portion.

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A2

28. (Amended) A pressure sensor comprising:

a base portion including a sensor cavity;

a diaphragm portion having a single crystal silicon diaphragm having a crystal plane orientation, said diaphragm being coupled to said base portion and located over said sensor cavity such that said diaphragm can flex and extend into or away from said sensor cavity when exposed to varying pressures, said diaphragm being aligned such that the crystal plane orientation of said diaphragm is generally not parallel or perpendicular to a longitudinal axis of said pressure sensor; and

at least one piezo resistor located on said diaphragm such that flexure of said diaphragm causes a change in resistance in said at least one piezo resistor.

A3

52. (Amended) A pressure sensor comprising:

a sensor body having a sensor cavity formed therein and a diaphragm generally covering said sensor cavity such that said diaphragm can flex into or away from said sensor cavity when said diaphragm is exposed to varying pressures; and

at least one piezo resistor located on said diaphragm, said at least one piezo resistor being elastic such that when a strain is applied to said piezo resistor in a first direction, the dimensions of said piezo resistor in a second direction perpendicular to said applied strain are changed in a manner that changes the resistivity of the piezo resistor in an appreciable manner.

Cancel claims 47-51 and 61 without prejudice.

Add the following new claims:

A4

62. A method for forming a sensor comprising the steps of:

providing a base wafer;

forming a sensor cavity in said base wafer using reactive ion etching;

coupling a diaphragm wafer to said base wafer such at least a portion of said diaphragm wafer generally covers said sensor cavity;

reducing the thickness of said diaphragm wafer; and

forming or locating at least one piezo resistive portion on said diaphragm wafer.

A4

63. The method of claim 62 wherein said reactive ion etching is deep reactive ion etching.

64. A pressure sensor comprising:

a base portion including a sensor cavity having generally vertically-extending side walls;

a diaphragm coupled to said base portion and located over said sensor cavity such that said diaphragm can flex and extend into or away from said sensor cavity when exposed to varying pressures; and

at least one piezo resistor located on said diaphragm such that flexure of said diaphragm causes a change in resistance in said at least one piezo resistor.

65. The method of claim 26 wherein said base wafer includes an upper layer, a lower layer, and an insulating layer disposed between said upper layer and said lower layer, and wherein said reducing step includes removing said lower layer of said base wafer while using said insulating layer as an etch stop.

66. The method of claim 65 wherein said base wafer is a silicon-on-insulator wafer, said upper and lower portions are silicon, and wherein said insulating layer is an oxide.

67. The method of claim 27 further comprising the step of reducing the thickness of said silicon-on-insulator wafer by removing one of said upper or lower layers while using said insulating layer as an etch stop.